4.5.5 Design Approach and Criteria of Flexible pavement

Pavement distress resulting from repeated application of traffic;

- Horizontal tensile strain at the bottom of the bituminous layer
- Vertical compressive strain at the top of the Sub grade

4.5.6 Design Standards Related to Pavement Design

Design standards related to pavement design are essentially based on the guidelines given in IRC: 37-2012 – "Tentative Guidelines for Design of Flexible Pavements".

Table 4. 1 Pavement Design Standards

	Design Parameters	Reference Code / Design Values
1.	Pavement Design	IRC: 37-2012- "Tentative Guidelines for Design of Flexible Pavements"
	Traffic Growth Rate	Adopted as per IRC: 37-2012
	Design Life	10 to 15 years
	Vehicle Damage Factor	Derived values based on Axle load survey. If these values are less than national average, then national average will be used.
	Lane Distribution Factor	As per IRC:37-2012
2.	Wearing Course Material	Bituminous Concrete

4.5.7 Information required for estimating design traffic

- Initial traffic in terms of number of Commercial Vehicles per day (CVPD).
- Traffic growth rate during the design life in percentage.
- Design life in number of years.
- Spectrum of axle loads.
- Vehicle Damage Factor (VDF).
- Distribution of commercial traffic over the carriageway.

4.5.8 Computation of Design Traffic

The design traffic in terms of the cumulative number of standard axles to be carried during the design life of the road should be computed using the following equation:

$$N = \frac{365 * \left[(1+r)^n - 1\right]}{r} * A * D * F$$

Where,

N = Cumulative number of repetitions in terms of million standard axles

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A = Initial traffic in the year of completion of construction in terms of the number of Commercial Vehicles per Day (CVPD).

D = Lane distribution factor (as explained in Para 4.5.1 (IRC: 37-2012)

F = Vehicle Damage Factor (VDF).

n = Design life in years.

r = Annual growth rate of commercial vehicles in decimal (e.g., for 5 per cent annual growth rate, r = 0.05).

Traffic Growth Rate

The present day traffic has to be projected for the end of design life at growth rates ('r') estimated by studying and analyzing the following data:

(i) The past trends of traffic growth; and

(ii) Demand elasticity of traffic with respect to macro-economic parameters (like GDP or SDP) and expected demand due to specific developments and land use changes likely to take place during design life.

If the data for the annual growth rate of commercial vehicles is not available or if it is less than 5 per cent, a growth rate of 5 per cent should be used.

The traffic in the year of completion is estimated using the following formula:

$$A=P\,(1+r)^n$$

Where,

P = Number of commercial vehicles as per last count.

n = Number of years between the last count and the year of completion of construction

4.5.9 Selection of Subgrade CBR for Pavement Design

The CBR values of the sub grade soil vary along a proposed alignment even on a homogeneous section. The pavement design is done based on Considering the CBR of Borrow area for Reconstruction and Widening Section and For Existing portion the CBR of Existing Sub grade / Sub base is considered.

4.5.10 Flexible Pavement Design – Re-construction

The CBR values of the subgrade soil vary along a proposed alignment even on a homogeneous section. The pavement design is done based on Considering the CBR of Borrow area for Reconstruction and Widening Section and For Existing portion the CBR of Existing Subgrade/Sub base is taken,

4.5.11 Widening Proposals & Typical Cross Sections

a) Widening options for the project road were arrived based on,

- Lane requirements based on traffic capacity analysis.

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- Requirement of service roads along built-up areas.
- Presence of religious structures.
- Availability of land

Formulation of carriageway widening schemes involves 1) estimation of extent of widening required in terms of additional lanes and 2) lateral arrangement of these additional lanes to the existing carriageway. Guidelines for the requirement of additional lanes is derived from, Traffic Study – Projected Traffic Volume vis-à-vis Capacity of each lane / road

Based on the TOR requirement of minimum Land Acquisition, i.e., within the existing ROW as far as possible, and retaining the existing pavement, cross drainage structures and bridges as far as possible, without compromising the recommendations of IRC / MORT&H.

Requirement of service roads along built-up areas. Additional lanes shall be added to the existing road either concentrically or eccentrically, depending on

1. The availability of right of way on either side of the existing centre line,
2. Topography and built-up areas
3. Due to specific field constraints (such as any sensitive features like water bodies, important structures etc.), localized shifting has been emerged at many places.

4.6 Proposed Improvements to Road Section

The proposals for the improvement of the geometric elements of the existing project road sections generally include:

a. Geometric Improvements

- Maintaining Uniform Carriageway.
- Improvements to cross sectional elements.

b. Strengthening of Existing Pavement

- Filling of potholes / damaged portion with WMM.
- Overlay for existing carriageway.
- Strengthening of Carriage way.

c. Road Drainage

- Desilting of Existing Side Drains.
- Rectification of damaged drains.
- Flagging Coarse for Existing Drain.
- Replacing damaged / Missing cover slabs.

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RIGID PAVEMENT DESIGN

RIGID PAVEMENT DESIGN:

A) The rigid pavement consists of cast in-situ/ premix concrete.

The slab design method is based on assessments of the:

- Predicted traffic volume and composition over the design period
- Strength of the subgrade in terms of its California Bearing Ratio
- Strength of the base concrete

B) A bound of lean mix concrete sub-base is recommended under a concrete pavement for one or more of the following reasons:

- To resist erosion of the sub-base and limit 'pumping" at joints and slab edges.
- To provide uniform support under the pavement
- To reduce deflection at joints and enhance load transfer across joints (especially if no other load transfer devices are provided, such as dowels); and
- To assist in the control of shrinkage and swelling of high-volume-change subgrade soils

Table 3.1 Approximate k Value Corresponding to CBR Values

Soaked subgrade CBR	2	3	4	5	7	10	15	20	50
k Value (MPa/m)	21	28	35	42	48	50	62	69	140

Table 3.2 Effective k Values Over Granular and Cementitious Subbases

Soaked CBR	2	3	4	5	7	10	15	20	50
k Value over granular subbase (thickness 150 to 250 mm), MPa/m	25	34	42	50	58	60	74	83	170
k Value over 150 to 200 mm cementations sub base MPa/m	42	56	70	84	96	100	124	138	280

The composition of pavement layers from the above Detailed Design is shown in table below.

Pavement compositions

Recommended Layers		
PQC	**Base Course**	**Sub Base Course**
150	150	150

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Chapter - 5
PROJECT COST ESTIMATES

5.1 Detailed Cost Estimate

Detailed cost Estimate has been worked out based on detailed engineering design

5.2 General

Cost Estimate is an important part of the Report as it provides vital input to financial evaluation of the project. The cost estimates have been prepared for Strengthening of the existing road including strengthening of longitudinal drains, road furniture, site clearance and Dismantling.

5.3 Basic rates

As part of Report, Rate Analysis of each of the item has been prepared by adopting PW, P & IWTD SR 2021 - 22, Bangalore Circle. The rates as given in PW, P & IWTD SR are to be enhanced by 3% for additional weightages for the works to be executed under extra ordinary conditions for Bangalore Metropolitan Limits. Items not covered in NHSR / PW, P & IWTD SR have been based on market rates.

5.4 Project Management and Quality Control

Provision of around 2.0% of Construction Cost has been made towards Cost of DPR Preparation, Quality Control, PMC and Proof Checking.

5.5 Project Cost

The total project cost for the proposed work is 1600.00 Lakh.

Detailed Cost Estimate is enclosed in **Annexure A. 5.1**

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Annexure A. 5.1
DETAILED COST ESTIMATE
RATE ANALYSIS

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Bruhat Bangalore Mahanagara Palike

Executive Engineer Yelahanka Project Division

Name of Work: Developments of roads and drains at Machohalli, Kadabagere, Gollarahatti (Kittanahalli), Singanayakanahalli Grama Panchayathi limits and surrounding areas of Yelahanka assembly Constituency Under

Draft Tender Schedule

Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
1	Earth work excavation by manual means for drains,canals, waste weir, draft, approach channels, key trenches, foundation of bridges and such simillar works in all kinds of soils , as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, excavated surface leveled and sides neatly dressed disposing off the excavated stuff or sorting & stacking the selected stuff for reuse in a radius of 50 m and lift upto 1.5 m including cost of labour, tools & other appurtenaces required to complete the work. Loading and Unloading of Stone Boulder/Stone aggregates/ Sand/Kankar/Moorum. (Tipper 5.5 m3) (V-I.No 1.4,Page No-5 PWD SR 2021-22) & (V-III Page No.3, Item No.1.1 Aof PWD SR 2021-22)	Cum	3970.86	313.12	Rupees Three Hundred Thirteen And Paise Twelve Only
2	Earth work in surface excavation by mechanical means for lowering & leveling the ground for all works other than foundation in all kinds of soils & upto depth not exceeding 300mm as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter including dressing of excavated surfaces, disposing off or levelling the excavated earth or sorting & stacking the selected earth for reuse in a radius of 50 m and lift upto 1.5 m including cost of labour, tools, usage of machinery & other appurtenances required to complete the work ((V-I, P.No-8, I No-1.12 of PWD SR 2021-22)	Cum	12665.17	66.95	Rupees Sixty Six And Paise Ninety Five Only
3	Cost of Haulage Excluding Loading and Unloading Taking output 10 t load and lead 10 km = 100 t.km (V-III Page No.3, Item No.1.4 A of PWD SR 2021-22)	t.km	21294.12	61.80	Rupees Sixty One And Paise Eighty Only
4	Providing and laying in position plain cement concrete for levelling course for all works in foundation. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed, laid in layers not exceeding 150 mm thickness, well compacted using plate vibrators, including all lead & lifts, cost of all materials of quality, labour, Usage charges of machineries, curing, and all the other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork shall be paid separately) Mix 1:3:6 (M10) Using 40 mm nominal size graded crushed coarse aggregates (V-1, P.No-15, I No-2.1.3 of PWD SR 2021-22)	Cum	541.78	5924.56	Rupees Five Thousand Nine Hundred Twenty Four And Paise Fifty Six Only
5	Providing and laying in position Reinforced cement concrete for all Sub structures of building, Irrigation works, Sub structure works of bridges, Drain works & other parallel works from 0.50m to 3.50 m height. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in layers, well compacted using needle vibrators, providing weep holes wherever necesary, including all lead & lifts, cost of all materials of quality, confirming to the requirements of relevant IS codes, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork to be paid separately) M20 Design Mix Using 20 mm nominal size graded crushed coarse aggregates (V-1,P.No.17, I.No.2.4.2 of PWD SR 2021-22)	Cum	1129.98	6765.86	Rupees Six Thousand Seven Hundred Sixty Five And Paise Eighty Six Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
6	Supplying, Fitting and Placing un-coated TMT bar Reinforcement in sub-structure complete as per Drawing and Technical Specifications.(V-III, I.No 13.1 Page No 99, PWD SR 2021-22)Issue Rate: 07-04-22	Ton	71.51	106428.87	Rupees One Lakh(s) Six Thousand Four Hundred Twenty Eight And Paise Eighty Seven Only
7	Providing and fixing precast reinforced cement concrete covering slabs of 10Cm thick made of M20 with OPC cement, with 20mm and down size graded granite metal coarse aggregate @0.70 mixed, Inculding providing and removing centering, shuttering, strutting propping etc., for edges of slabs with TMT steel (Fe500) cost of all materials, labour, all lead and lift, HOM of machinery, curing, including cost of reinforcement etc., complete as directed by the Engineer in charge of the work.	Sqm	2661.60	2072.00	Rupees Two Thousand Seventy Two Only
8	Providing and fixing precast reinforced cement concrete covering slabs of 23Cm thick made of M20 with OPC cement,with 20mm and down size graded granite metal coarse aggregate @0.70 mixed, Inculding providing and removing centering, shuttering, strutting propping etc., for edges of slabs with TMT steel (Fe500) cost of all materials, labour, all lead and lift, HOM of machinery, curing, including cost of reinforcement etc., complete as directed by the Engineer in charge of the work.	Sqm	289.32	5037.00	Rupees Five Thousand Thirty Seven Only
9	Providing and fixing pre cast solid cement concrete Kerb stones made out of M20 with top width 100mm and bottom width 150mm respectively,300mm high with CM 1:3 plastering and finishing cutting including from work, curing, including cost of all materials , labour, hire charges of machinery, loading, unloading, lead and lift, transportation etc., complete to be laid between travel lane and Cycle track/Land scape with all lead , lift, loading and unloading complete as per the direction of engineer in charge (from finish concrete and no painting to be done) (Approved Rate)	Nos	324.00	507.00	Rupees Five Hundred Seven Only
10	Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces (V-III, P.No.56, I.No.8.10 of PW, PWD SR 2021-22)	Sqm	51.10	93.50	Rupees Ninety Three And Paise Fifty Only
11	Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 m3 in volume and stock piling at designated locations and disposal of dismantled materials and stacking serviceable and unserviceable materials separatel (V-III Page No.10, Item No.2.19 of PWD SR 2021-22)	Cum	138.60	464.20	Rupees Four Hundred Sixty Four And Paise Twenty Only
12	Construction of Granular Sub-Base of required grading as per design mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401 .(V-III, I No-4.1V,P No-19.KPWD SR 2021-22)	Cum	6687.05	2417.41	Rupees Two Thousand Four Hundred Seventeen And Paise Forty One Only
13	Providing and laying in position plain cement concrete for levelling course for all works in foundation. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed, laid in layers not exceeding 150 mm thickness, well compacted using plate vibrators, including all lead & lifts, cost of all materials of quality, labour, Usage charges of machineries, curing, and all the other appurtenances required to complete the work as pertechnical specifications. (The cost of steel reinforcement & formwork shall be paid separately) Mix 1:4:8 (M5) Using 40 mm nominal size graded crushed coarse aggregates (V-I, P.No-15, I No-2.1.2 of PWD SR 2021-22)	Cum	6691.55	5524.92	Rupees Five Thousand Five Hundred Twenty Four And Paise Ninety Two Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
14	Providing and constructing un-reinforced plain cement concrete pavement, thickness as per design, over a prepared sub base, with 43 grade cement or any other type as per Clause 1501.2.2 M30 (Grade), coarse and fine aggregates conforming to IS:383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a concrete mixer of not less than 0.2 cum capacity andappropriate weigh batcher using approved mix design, laid in approved fixed side formwork (steel channel, laying and fixing of 125 micron thick polythene film, wedges, steel plates including levelling the formwork as per drawing), spreading the concrete with shovels, rakes,compacted using needle, screed and plate vibrators and finished in continuous operation including construction joints, , primer, sealant , curing of concrete slabs for 14-days, and water finishing to lines and grade as per drawing and technical specification clause 1501 with all lead, lifts, loading & unloading charges, cost and conveyance of all materials, labour, equipments etc.,	Cum	6691.55	7042.11	Rupees Seven Thousand Forty Two And Paise Eleven Only
15	Supply and fixing of Retro Reflective Single arrow road name sign board of size 2000mm x 900mm made out of retro reflective sheeting conforming to Type XI standards of ASTM D 4956 - 09 & as per IRC 67-2012 for full back ground of blue colour & white letters and fixed over 4 mm thick Aluminium Composite Material sheet having minimum 0.5 mm thick Aluminium skin on both sides with back side painted grey colour and fixed over back support frame SS angle of 15mm x 20mm x 1.2mm, supported by 38mm OD stainless steel pipe all round in 304 grade and 2 nos of vertical posts of 50 mm OD stainless steel pipe of 202 grade firmly fixed to the ground by means of properly designed foundation of size 450mm x 450mm x 600mm in 1:1.5:3 ratio cement concrete. The background shall be blue in color with letters and border in white, the item includes earthwork excavation, cost of all materials, loading, unloading, lead, lift, transportation etc., complete. as per clause 6.9 of IRC 67-2012 for Type XI retro reflective sheeting from t	Nos	80.00	38000.00	Rupees Thirty Eight Thousand Only
16	Supply and fixing of Retro Reflective Double arrow road name sign board of size 2000mm x 900mm made out of retro reflective sheeting conforming to Type XI standards of ASTM D 4956 - 09 & as per IRC 67-2012 for full back ground of blue colour & white letters and fixed over 4 mm thick Aluminium Composite Material sheet having minimum 0.5 mm thick Aluminium skin on both sides with back side painted grey colour and fixed over back support frame SS angle of 15mm x 20mm x 1.2mm, supported by 38mm OD stainless steel pipe all round in 304 grade and 2 nos of vertical posts of 50 mm OD stainless steel pipe of 202 grade firmly fixed to the ground by means of properly designed foundation of size 450mm x 450mm x 600mm in 1:1.5:3 ratio cement concrete. The background shall be blue in color with letters and border in white, the item includes earthwork excavation, cost of all materials, loading, unloading, lead, lift, transportation etc., complete. as per clause 6.9 of IRC 67-2012 for Type XI retro reflective sheeting from t	Nos	20.00	44000.00	Rupees Forty Four Thousand Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
17	Providing and laying in position plain cement concrete for levelling course for all works in foundation. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed, laid in layers not exceeding 150 mm thickness, well compacted using plate vibrators, including all lead & lifts, cost of all materials of quality, labour, Usage charges of machineries, curing, and all the other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork shall be paid separately) Mix 1:3:6 (M10) Using 40 mm nominal size graded crushed coarseaggregates (V-I Page No.15, Item No.2.1.3 of PWD SR 2021-22)	Cum	25.32	5924.56	Rupees Five Thousand Nine Hundred Twenty Four And Paise Fifty Six Only
18	Providing and laying in position Reinforced cement concrete for all Foundation works. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticizers laid in finished layers, well compacted using needle vibrators, including all lead & lifts, cost of all materials, quality confirming to the requirements of relevant IS codes , labour, Usage charges of machinery, curing and all the other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork to be paid separately) M25 Design Mix Using 20 mm nominal size graded crushed coarse aggregates (V-I Page No.15, Item No.2.2.2.1 of PWD SR 2021-22)	Cum	18.77	7120.91	Rupees Seven Thousand One Hundred Twenty And Paise Ninety Only
19	Providing and laying in position Reinforced cement concrete for all Super structures of building , Road works, Water works, Irrigation works & super structure works of bridges upto 3.50 m height. The granite/ trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers laid in layers, well compacted using needle vibrators. The cost includes all lead & lifts, cost of all materials, quality confirming to the requirements of relevant IS codes , labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement, dowel bars & formwork to be paid separately)M20 Design Mix Using 20 mm nominal size graded crushed coarse aggregates (V-I Page No.17, Item No.2.5.1 of PWD SR 2021-22)	Cum	52.95	7331.64	Rupees Seven Thousand Three Hundred Thirty One And Paise Sixty Four Only
20	Providing Size Stone masonry with hard stone in foundation & plinth with Cement mortar 1:6(1 cement : 6 coarse sand) (V-II Page No.9, Item No.5.4 of PWD SR 2021-22)	Cum	70.75	5584.66	Rupees Five Thousand Five Hundred Eighty Four And Paise Sixty Six Only
21	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations and other similar works etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.(V-I Page No.7, Item No.1.9 of PWD SR 2021-22)	Cum	276.69	210.12	Rupees Two Hundred Ten And Paise Twelve Only
22	Providing Thermo-Mechanically Treated bars of grade Fe-500D or more Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position, binding and anchoring to adjacent members whereever necessary complete as per Design including cost of material, labour, usage charges complete as per specifications. (The laps and wastages shall not be measured separately) (V-II Page No.11.32, Item No.84 of PWD SR 2021-22)	kg	8122.98	109.18	Rupees One Hundred Nine And Paise Eighteen Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
23	Providing and constructing load bearing wall with Solid Concrete blocks of size 400x200x200mm having block density more than 1800kg/m3 and minimum compressive strength of 4.00 N/mm2 conforming to IS2185 (Part - I) - 2005 and constructed with CM 1:4 as per IS 2572:2005 including cost of all materials, labour, scaffolding and curing, usage charges of machinery etc complete as per specifications. (V-II Page No.17, Item No.6.32 of PWD SR 2021-22)	Sqm	249.46	1238.06	Rupees One Thousand Two Hundred Thirty Eight And Paise Six Only
24	Providing and constructing load bearing wall with Solid Concrete blocks of size 400x100x200mm having block density more than 1800kg/m3 and minimum compressive strength of 4.00 N/mm2 conforming to IS 2185 (Part - I) - 2005 and constructed with CM 1:4 as per IS 2572:2005 including cost of all materials, labour, scaffolding and curing, usage charges of machinery etc complete as per specifications.(V-II Page No.17, Item No.6.34 of PWD SR 2021-22)	Sqm	51.20	974.38	Rupees Nine Hundred Seventy Four And Paise Thirty Eight Only
25	Providing and laying water proofing treatment to the Roof with PU based single component elastomeric pure polyurethane based coating on New terrace/Chajjas/Sunken portion of WC:Bathroom, cold applied PU waterproofing membrane that is highly elastic with elongation greater than 400% and tensile strength greater than 2MPa as per ASTM D412. The waterproofing membrane to be applied in 2coats @ 1.6kg per m2 to achieve final DFT (dry film thickness) of 1mm including prime coat of epoxy primer @150 g per m2 and protection with 120gsm Geo-textile over the waterproofing membrane. The finished cost to include surface preparation, making coving at Junction, Bore Packing, treatment of construction joints completely as per specification & with a 10 years warranty on product & work from certified manufacturers as per the direction of the Engineer In charge.(V-II Page No.133, Item No.15.1 of PWD SR 2021-22)	Sqm	175.12	767.35	Rupees Seven Hundred Sixty Seven And Paise Thirty Five Only
26	Providing Honne wood frames of doors, windows, clerestory windows, ventilators and other frames, wrought, framed or assembled including making plaster groves (excluding cost of cement concrete and side clamps), but including cost of materials, labour, usage charges complete as per specifications.(V-II Page No.99, Item No.12.11 of PWD SR 2021-22)	Cum	0.29	93104.79	Rupees Ninety Three Thousand One Hundred Four And Paise Seventy Nine Only
27	Fixing of door frame in an existing opening including embedding frame in floor and walls after cutting masonry for holdfasts for embedding holdfast in cement concrete 1:3:6 of 20mm and down size granite metal painting two coats of coal tar to sides of frame, making good the damages to walls and floor as required and disposal of the debris with lead upto 50 m. including cost of materials, labour charges, complete as per specifications.(V-II Page No.105, Item No.12.51 of PWD SR 2021-22)	Nos	2.00	1529.55	Rupees One Thousand Five Hundred Twenty Nine And Paise Fifty Five Only
28	Providing and fixing flush door shutter made out of solid core block board type, well seasoned , chemicaly treated hard wood battens and internal frame with minimum 45 mm wide wooden frame alround door shutters covered with cross bonded wooden sheets (core veneer) hot pressed and fastened on both sides of the door useing liquid phenol formaldehyde resin as per IS specifications 2202 (part-I) 1991. from manufacturer complete as per spcification. 30 mm thick both side commercial (V-II Page No.105, Item No.12.51 of PWD SR 2021-22).	Sqm	7.56	2717.14	Rupees Two Thousand Seven Hundred Seventeen And Paise Fourteen Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
29	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer. Using M.S. angels 40x40x6 mm for diagonal braces including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.(V-II, Page No.75, Item No.11.5.1 of PWD SR 2021-22)	Sqm	20.16	3769.80	Rupees Three Thousand Seven Hundred Sixty Nine And Paise Eighty Only
30	Providing & fixing of 2-track x 2-panel sliding windows made out of multi chambered UPVC(Matching to RAL-9016) sections and with minimum TiO2(Titanium Dioxide) at 6 PHR with TPE (Thermo Plastic Elastomer) and lead free, gaskets -grey color having isolated drainage and reinforced with Galvanized Iron profile through-out the window frame. The outer frame having an overall size of 44mm width x 40mmheight with reinforcement of 1mm thickness and Sash with overall size of 27mm X 53mm with UPVC honeycomb structure inside in lieu of GI reinforcement. Coextruded Glazing bead for fixing of glass shall be of size 9.5mm x 21.5mm. Windows shall be provided with 5mm plain float glass, standard hardware& single point locking system with Crescent Locks. Wall thickness of frame & sash shall be of 2 mm.Maximum possible size – 1219mm x 1219mm. (The cost is inclusive of all fixtures and separate charges for minor T&P's shall not be made) (V-II, Page No.110, Item No.12.84 of PWD SR 2021-22)	Sqm	27.36	4237.42	Rupees Four Thousand Two Hundred Thirty Seven And Paise Forty Two Only
31	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete. Fixed to steel windows by welding (V-II, Page No.85, Item No.11.34A of PWD SR 2021-22)	Kg	574.56	134.93	Rupees One Hundred Thirty Four And Paise Ninety Three Only
32	Providing and laying flooring and steps fine machine polished granite stone slabs 20 mm thick on cement mortar bed 1:6, 20 mm thick, and joints finished with cement mortar 1:3 over existing cement concrete bed including cost of materials, mortar, labour, curing complete as per specifications.(V-II, Page No.64, Item No.9.30 of PWD SR 2021-22)	Sqm	135.40	2473.03	Rupees Two Thousand Four Hundred Seventy Three And Paise Three Only
33	Providing and laying flamed finish Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing, curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge : ** Flamed finish granite stone slab Black, Cherry Red, Brown, Cat Eye, River Pink or equivalent. (V-II, Page No.63, Item No.9.23 of PWD SR 2021-22)	Sqm	5.04	1955.97	Rupees One Thousand Nine Hundred Fifty Five And Paise Ninety Seven Only
34	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer), of 1st quality conforming to IS : 15622, of approved make, in all colours, shades, except White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick bed of cement mortar 1:4 (1 Cement : 4 Coarse sand), jointing with grey cement slurry @ 3.3 kg/ m2 including pointing the joints with white cement and matching pigments etc., complete (V-II, Page No.60, Item No.9.11 of PWD SR 2021-22)	Sqm	28.03	796.19	Rupees Seven Hundred Ninety Six And Paise Nineteen Only
35	Providing skirting, dadooing, rises of steps with white glazed tiles 6mm thick on 10mm thick cement plaster 1:3 and jointed with white cement slurry over existing rough plaster surface using glazed tiles of approved make and size including cost of materials, labour, complete as per specifications.(V-II, Page No.65, Item No.9.38 of PWD SR 2021-22)	Sqm	89.52	2021.89	Rupees Two Thousand Twenty One And Paise Eighty Nine Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
36	Providing 20 mm cement plaster of mix :1:4 (1 cement: 4 fine sand) to brick/stone masonary including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge.(V-II, Page No.41, Item No.8.3.1 of PWD SR 2021-22)	Sqm	391.10	316.21	Rupees Three Hundred Sixteen And Paise Twenty One Only
37	Providing 15 mm cement plaster on the rough side of single or half brick wall of mix 1:4 (1 cement: 4 fine sand) including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge.(V-II, Page No.41, Item No.8.2.1 of PWD SR 2021-22)	Sqm	385.02	260.59	Rupees Two Hundred Sixty And Paise Fifty Nine Only
38	Wall painting with acrylic emulsion paint of approved brand and manufacture to give an even shade :Two coats on new work after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge. (V-II, Page No.48, Item No.8.39 of PWD SR 2021-22)	Sqm	391.10	97.85	Rupees Ninety Seven And Paise Eighty Five Only
39	Providing White washing with lime to give an even shade :New work (three coats) with lime of approved quality, including cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge. (V-II, Page No.44, Item No.8.21 of PWD SR 2021-22)	Sqm	385.02	19.57	Rupees Nineteen And Paise Fifty Seven Only
40	Finishing walls with Acrylic Smooth exterior paint of required shade :New work (Two coat applied @ 1.67 ltr/10 m² over and including priming coat of exterior primer applied @ 2.20 kg/10 m²) with paint of approved quality to give an even shade, after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.(V-II, Page No.46, Item No.8.30 of PWD SR 2021-22)	Sqm	385.02	140.08	Rupees One Hundred Forty And Paise Eight Only
41	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade :Two coats on new work over an under coat of suitable shade with ordinary paint of approved brand and manufacture after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.(V-II, Page No.48, Item No.8.41 of PWD SR 2021-22)	Sqm	27.36	133.90	Rupees One Hundred Thirty Three And Paise Ninety Only
42	Providing and fixing chromium plated brass handles of 100/125 mm with necessary screws etc. Complete(V-II Page No.107, Item No.12.62 of PWD SR 2021-22)	Nos	4.00	180.25	Rupees One Hundred Eighty And Paise Twenty Five Only
43	Providing and fixing ISI marked M.S. pressed butt hinges bright finished with necessary screws etc.125x65x2.12mm(V-II Page No.107, Item No.12.68.1 of PWD SR 2021-22)	Nos	20.00	39.14	Rupees Thirty Nine And Paise Fourteen Only
44	Providing and fixing bright finished brass tower bolts (barrel type) with necessary screws etc. Complete 250x10mm (V-II Page No.109, Item No.12.76 of PWD SR 2021-22)	Nos	4.00	347.11	Rupees Three Hundred Forty Seven And Paise Eleven Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
45	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in charge. Concealed work, including cutting chases and making good the walls etc. 25mm nominal dia pipes (V-II Page No.124, Item No.13.32.3 of PWD SR 2021-22)	m	60.00	490.28	Rupees Four Hundred Ninety And Paise Twenty Eight Only
46	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in charge. Concealed work, including cutting chases and making good the walls etc. 20mm nominal dia pipes (V-II Page No.124, Item No.13.32.2 of PWD SR 2021-22)	m	60.00	384.19	Rupees Three Hundred Eighty Four And Paise Nineteen Only
47	Providing and fixing white vitreous china pedestal type water closet (European type) with seat and lid, 10 litre low level white vitreous china flushing cistern & C.P. flush bend with fittings & C.I. brackets, 40 mm flush bend, overflow arrangement with specials of standard make and mosquito proof coupling of approved municipal design complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required : W.C. pan with ISI marked white solid plastic seat and lid (V-II Page No.123, Item No.14.3.1 of PWD SR 2021-22)	Each	8.00	5155.15	Rupees Five Thousand One Hundred Fifty Five And Paise Fifteen Only
48	Providing and fixing white vitreous china laboratory sink with C.I. brackets, C.P. brass chain with rubber plug, 40 mm C.P brass waste and 40mm C.P. brass trap with necessary C.P. brass unions complete, including painting of fittings and brackets, cutting and making good the wall wherever required : Size 600x450x200 mm (V-II Page No.126, Item No.14.11.2 of PWD SR 2021-22)	Each	4.00	4783.32	Rupees Four Thousand Seven Hundred Eighty Three And Paise Thirty Two Only
49	Providing and fixing white vitreous china flat back half stall urinal of size 580x380x350 mm with white PVC automatic flushing cistern, with fittings, standard size C.P. brass flush pipe, spreaders with unions and clamps (all in C.P. brass) with waste fitting as per IS : 2556, C.I. trap with outlet grating and other couplings in C.P. brass, including painting of fittings and cutting and making good the walls and floors wherever required : Single half stall urinal with 5 litre P.V.C. automatic flushing cistern (V-II Page No.124, Item No.14.5.1 of PWD SR 2021-22)	Each	4.00	6826.84	Rupees Six Thousand Eight Hundred Twenty Six And Paise Eighty Four Only
50	Supplying PVC ringtite pipes conforming to IS 4985:2000 with latest amendments and conveying to worksite, rolling and lowering into trenches, laying true to line and level and perfect linking at joints, testing and commissioning, including loading unloading at both destinations and cuts of pipes wherever necessary including jointing of PVC pipes and specials (excluding cost of specials) with jointing of approved type, with all labour with all lead & lift including encasing the pipe alround to a depth of not less than 15 cms. with soft gravel or selected earth available from the excavation etc. complete and giving necessary hydraulic test to the required pressure as per ISS (Contractor will make his own arrangements for procuring water for testing) etc. for:PVC pipes 110mm dia., 6 kg/sqcm & class 3(Page No.134, Item No.1.7 of BWSSB SR 2021-22)	m	90.00	405.82	Rupees Four Hundred Five And Paise Eighty Two Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
51	Providing and placing on terrace, polyethylene water storage tanks as per IS 12701 :1996 with manhole lid and suitable locking\ arrangements, making holes of suitable diameter for inlet, outlet and over flow pipes, including cost of all materials, labour, transport charges, HOM of equipments and testing complete as per spedfications.(For1000 litre capacity)	L	2000.00	8.76	Rupees Eight And Paise Seventy Six Only
52	Providing and fixing gun metal non- return valve of approved quality (screwed end)(V-II Page No.115, Item No.13.6.1.2 of PWD SR 2021-22)	Nos	8.00	569.59	Rupees Five Hundred Sixty Nine And Paise Fifty Nine Only
53	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete(V-II Page No.115, Item No.13.5.2 of PWD SR 2021-22)	Each	16.00	370.80	Rupees Three Hundred Seventy And Paise Eighty Only
54	Providing and fixing PTMT pillar cock of approved quality and colour15 mm nominal bore, 125 mm long foam flow, weighing not less than 120 gms(V-II Page No.118, Item No.13.20.2 of PWD SR 2021-22)	Each	16.00	226.60	Rupees Two Hundred Twenty Six And Paise Sixty Only
55	Bottle trap 38 mm single piece moulded with height of 270 mm, effective length of tail pipe 260 mm from the centre of the waste coupling, 77 mm breadth with 25 mm minimum water seal, weighing not less than 263 gms (V-II Page No.129, Item No.14.37.2 of PWD SR 2021-22)	Each	16.00	251.32	Rupees Two Hundred Fifty One And Paise Thirty Two Only
56	Concealed Conduit System Supplying heavy gauge PVC conduit pipe 19/20mm dia 2mm thick conforming to IS 2509 with suitable size bends, metal/PVC junction boxes adhesive paste etc., and running before concreting the slab. The conduit should be tied to the reinforcement rods by using binding wires and unused ways of junction boxes and pipes ends should be covred using PVC end enclosures. run with 18SWG GI fish wire wherever necessary.19/20mm dia 2mm thick (Page No.1, Item No.1.2.1 of PWD Electrical SR2022-23)	Mtr	90.00	61.00	Rupees Sixty One Only
57	Concealed Conduit System Supplying heavy gauge PVC conduit pipe 25mm dia 2mm thick conforming to IS 2509 with suitable size bends, metal/PVC junction boxes adhesive paste etc., and running before concreting the slab. The conduit should be tied to the reinforcement rods by using binding wires and unused ways of junction boxes and pipes ends should be covred using PVC end enclosures. run with 18SWG GI fish wire wherever necessary.a)25mm dia 2 mm thick (Page No.1, Item No.1.2.2 of PWD Electrical SR 2021-22	Mtr	90.00	70.00	Rupees Seventy Only
58	Concealed Conduit System Supplying heavy gauge PVC conduit pipe 19/20mm dia 2mm metal/PVC junction boxes adhesive paste etc. By groove cutting in the wall and fixing by bracing U or J hooks and cement plastering up to the surface of the brick level and run with 18 SWG GI fish wire run through out the conduit wherever necessary.19/20mm dia 2mm thick(Page No.1, Item No.1.3.1 of PWD Electrical SR 2021-22)	Mtr	90.00	75.00	Rupees Seventy Five Only
59	Concealed Conduit System Supplying heavy gauge PVC conduit pipe 25mm dia 2.mm metal/PVC junction boxes adhesive paste etc. By groove cutting in the wall and fixing by bracing U or J hooks and cement plastering up to the surface of the brick level and run with 18 SWG GI fish wire run through out the conduit wherever necessary.a)25mm dia 2 mm thick (Page No.1, Item No.1.3.2 of PWD Electrical SR 2021-22)	Mtr	90.00	80.00	Rupees Eighty Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
60	Concealed Conduit System Supplying heavy gauge PVC conduit pipe 32mm dia 2.5mm metal/PVC junction boxes adhesive paste etc. By groove cutting in the wall and fixing by bracing U or J hooks and cement plastering up to the surface of the brick level and run with 18 SWG GI fish wire run through out the conduit wherever necessary.32mm dia 2.5 mm thick (Page No.1, Item No.1.3.3 of PWD Electrical SR 2021-22)	Mtr	20.00	105.00	Rupees One Hundred Five Only
61	Wiring for lighting/power circuit using one of FRLS PVC insulated 1100v grade, multistrand Copper conductor single core cable in open or concealed system of wiring with specified IS-694:1990 & conforming to GTP of Group-A (Page No.3, Item No.2.3 of PWD Electrical SR 2021-22) 1.0 Sqm		200.00	18.00	Rupees Eighteen Only
62	1.5 Sqm	Mtr	200.00	26.00	Rupees Twenty Six Only
63	2.5 Sqm	Mtr	200.00	40.00	Rupees Forty Only
64	4.0 Sqm	Mtr	200.00	59.00	Rupees Fifty Nine Only
65	10.0 Sqm	Mtr	200.00	157.00	Rupees One Hundred Fifty Seven Only
66	Point wiring using Copper wire without switch.Supplying and wiring adopting loop system in existing PVC Conduit/casing capping using 1100V Grade, COPPER conductor flexible multistrand FRLS PVC insulated, 2x1.5 Sq.mm Cable confirming to the GTP without switch, the other end of the wires shall be terminated with sufficient loose lenght in a wood/PVC round block. complete for each outlet.(5/2.3) Using class A materials (Page No.3, Item No.2.2 of PWD Electrical SR 2021-22)Short point up to 3mtrs from tapping point to out let via switch (Page No.3, Item No.2.2.1 of PWD Electrical SR 2021-22)	Point	36.00	251.00	Rupees Two Hundred Fifty One Only
67	Medium point a above 3mtr up to 6mtr from tapping point to out let via switch (Page No.3, Item No.2.2.2 of PWD Electrical SR 2021-22)	Point	36.00	361.00	Rupees Three Hundred Sixty One Only
68	Long point a above 6mtr up to 10mtr from tapping point to out let via switch (Page No.3, Item No.2.2.3 of PWD Electrical SR 2021-22)	Point	24.00	542.00	Rupees Five Hundred Forty Two Only
69	Supplying and fixing miniature circuit breakers on existing MCB distribution boards using necessary fixing materials and 'C' Type curve , indicator ON/OFF, energy cross-3 with Short circuit breaking capacity of 10K and complete wiring as required conforming to IEC60898.5-32Amps DP (Page No.13, Item No.5.17 of PWD Electrical SR 2021-22)6-32Amps SP	Each	20.00	523.00	Rupees Five Hundred Twenty Three Only
70	6-32 Amps DP	Each	20.00	1103.00	Rupees One Thousand One Hundred Three Only
71	40 Amps TPN	Each	14.00	2393.00	Rupees Two Thousand Three Hundred Ninety Three Only
72	50-63 Amps SP	Each	14.00	734.00	Rupees Seven Hundred Thirty Four Only
73	Supplying and fixing regular MCB distribution boards on wall / wood board / flush mounting using required clamps, bolts, nuts etc., with provision for fixing suitable type capacity MCB's single phase / 3 phase / single door with powder coated painting. Made out of 14 SWG MS enclosure,III-Single Door.Group A12Way SP &N (Page No.13, Item No.5.18.4 of PWD Electrical SR 2021-22)	Each	6.00	1591.00	Rupees One Thousand Five Hundred Ninety One Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
74	Supplying and fixing regular MCB distribution boards on wall/wood board/flush mounting using required clamps, bolts, nuts etc. with provision for fixing suitable type capacity MCB's single phase/3 phase/single door with power coated painting etc., complete: Double door: 6 way TP &N , Group (A) (Page No.13, Item No.5.18.12 of PWD Electrical SR 2021-22)	Each	6.00	3735.00	Rupees Three Thousand Seven Hundred Thirty Five Only
75	Supplying and fixing 32Amps security and energy saving DP switch with key tag suitable to operate on 230 Volts, 50Hz AC supply & completely wired on existing box. (Page No.6, Item No.3.7 of PWD Electrical SR 2021-22)	Each	14.00	747.00	Rupees Seven Hundred Forty Seven Only
76	Supplying and flush mounting powder coated / galvanized metal box suitable for mounting modular switch plates. The box should be firmly flush mounted after due groove cutting in Brick/Stone/C.C wall 1-3 Way (Page No.5, Item No.3.4.1 of PWD Electrical SR 2021-22)	Each	100.00	123.00	Rupees One Hundred Twenty Three Only
77	Supplying and fixing of 20/40 Watts heavy duty open construction Ferromagnetic copper ballast for fluorescent tubes : Supplying and fixing of 20/40 Watts heavy duty open construction Ferromagnetic copper ballast for fluorescent tubes, Class H Insulated copper wire, Vacuum impregnated high quality with Low loss silicon steel lamination operated on 240V,50Hz supply with IEC 60920 (Safety) & IEC 60921(Performance). Operating voltage range from 180V to 265V, 50Hz AC power Supply. (Page No.41, Item No.12.23 of PWD Electrical SR 2021-22)	Each	20.00	300.00	Rupees Three Hundred Only
78	Supply and fixing metal fan box with round hook (Page No.2, Item No.1.12 of PWD Electrical SR 2021-22)	Nos	16.00	163.00	Rupees One Hundred Sixty Three Only
79	Supplying and fixing of modular switch & connected accessories on existing modular switch plate as per IS 3854 and IS 1293.(Page No.5, Item No.3.6 of PWD Electrical SR 2021-22) 6Amps SP Switch	Each	10.00	88.00	Rupees Eighty Eight Only
80	6Amps 3way 5 pin socket	Each	10.00	162.00	Rupees One Hundred Sixty Two Only
81	16Amps SP Switch	Each	8.00	249.00	Rupees Two Hundred Forty Nine Only
82	32Amps Flush/projected types DP switch	Each	8.00	375.00	Rupees Three Hundred Seventy Five Only
83	Supplying and fixing flush mounting powder coated / galvanized metal box suitable for mounting modular switch plates. The box should be firmly flush mounted after due groove cutting in Brick/Stone/C.C wall (Page No.5, Item No.3.4 of PWD Electrical SR 2021-22) 1-3Way	Each	20.00	123.00	Rupees One Hundred Twenty Three Only
84	4-5Way	Each	20.00	138.00	Rupees One Hundred Thirty Eight Only
85	6Way	Each	20.00	212.00	Rupees Two Hundred Twelve Only
86	8Way	Each	24.00	250.00	Rupees Two Hundred Fifty Only
87	10-12Way	Each	16.00	325.00	Rupees Three Hundred Twenty Five Only
88	16Way	Each	4.00	354.00	Rupees Three Hundred Fifty Four Only
89	Supplying and fixing superior quality modular switch mounting polycarbonate plate with necessary supporting back plate with required nos. of machine screws, bolts nuts etc., complete on the existing metal/PVC box. (Page No.5, Item No.3.5 of PWD Electrical SR 2021-22) 1 to 3 Module	Each	20.00	152.00	Rupees One Hundred Fifty Two Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
90	4Moudule	Each	20.00	175.00	Rupees One Hundred Seventy Five Only
91	6Moudule	Each	20.00	244.00	Rupees Two Hundred Forty Four Only
92	8Moudule	Each	24.00	302.00	Rupees Three Hundred Two Only
93	10Moudule	Each	16.00	363.00	Rupees Three Hundred Sixty Three Only
94	12Moudule	Each	4.00	403.00	Rupees Four Hundred Three Only
95	Supplying capacitor type ceiling fan complete with down rod blades, shackle, canopies for operation on 230 Volts, 50 Cycles. Single phase AC supply conforming to ISS-374-1979 and with double ball bearing system.(84/9.3)56" Sweep (1400mm) Regular model (Page No.22, Item No.6.3.2 of PWD Electrical SR 2021-22)	Each	16.00	2170.00	Rupees Two Thousand One Hundred Seventy Only
96	Supplying and fixing of Electronic Ballast suitable for T8 Lamp with housing made of Pre-coated steel/PC, Operating voltage range from 180V to 265V, 50Hz AC power Supply flicker free warm start with over voltage protection, Inrush current protection, De-activated lamp protection & End of Lamp life protection with PF> 0.95 & TC(deg C) > 65 degC. Operating voltage range from 180V to 265V, 50Hz AC power Supply.(Page No.40, Item No.12.22.3 of PWD Electrical SR 2021-22)	Each	8.00	725.00	Rupees Seven Hundred Twenty Five Only
97	Fixing all types and all capacities of fluorescent / false ceiling / spot light / CFL / LED fittings indoor on the wall / ceiling / rafters / girders using 23/0.0076" twin twisted PVC insulated wires, required Nos of round blocks and clamps. 14.7.1 On wall / ceiling / Rafter / Girders (Page No.45, Item No.13.7.1 of PWD Electrical SR 2021-22)	Each	8.00	119.00	Rupees One Hundred Nineteen Only
98	Earthing: Supplying and fixing and wiring earth electrode for grounding circuits IC cutouts and other equipments on the meter board in the pit. The pits should be filled up with equal proportion of salt and charcoal 150mm around the pipe to complete depth. The connection from the pipe to the conduits etc. is to established through GI wire of sizes as per clause 7.3.3 of IS 732 using 12mm bolts, nuts, washers and check nuts, the pipe shall have 16 through holes of 12mm dia (Page No.164, Item No.45 of BWSSB SR 2021-22)	Job	2.00	3862.50	Rupees Three Thousand Eight Hundred Sixty Two And Paise Fifty Only
99	Geophysical investigation at site for sinking borewells for supplying drinking water to the habitation either through the Hand Pump MWS or P.W.S.S, by vertical electrical sounding by adopting Venner orSchlumbergers's method, including reconnaissance survey of geological formation. Geophysical investigation of existing ground water in the vicinity, its quality, quantity and acceptability of the users, indicating the location of the site, recommended depth of casing pipe required to seal the top unconsolidated formation including an extra depth of 1.0 metre in consolidated formation for proper seating of casing pipe, depth of drilling required to cover full depth of aquifer proposed to be tapped, probable yield and other information required including transportation of instruments and accessories to work site, engaging technical personal and labour required etc. NOTE: 1) Additional rate on item 1&2 is allowed for drilling in over burden and fixing Casing pipes beyond 20 M (for fixing Casing pipes only) a	Nos	4.00	5295.23	Rupees Five Thousand Two Hundred Ninety Five And Paise Twenty Three Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
100	Sinking of Borewell of 165mm dia clear using super fast hydraulic rig of capacity 300 PSIG & above 1100 CMF & above in all strata including over burdern upto 20 m. Fixing of casing pipes, collars and cap with necessary cutting, threading and welding including transportation of rig and supporting vehicle, crew charges and cost of consumables etc., complete including yield testing at the final depth with a minimum working of compressor for one hour (Excluding cost of casing pipes, collars, cap etc., complete)(P.151, I.No-1) BWSSB.SR 2021-220 to 50 m (Code No-O010A)	M	200.00	298.70	Rupees Two Hundred Ninety Eight And Paise Seventy Only
101	50 to 100 m (Code No-O010B)	M	200.00	374.92	Rupees Three Hundred Seventy Four And Paise Ninety Two Only
102	100 to 150 m (Code No-O010C)	M	200.00	398.61	Rupees Three Hundred Ninety Eight And Paise Sixty One Only
103	150 to 200 m (Code No-O010D)	M	200.00	462.47	Rupees Four Hundred Sixty Two And Paise Forty Seven Only
104	200 to 250 m (Code No-O010E)	M	200.00	542.81	Rupees Five Hundred Forty Two And Paise Eighty One Only
105	250 to 300 m (Code No-O010F)	M	200.00	574.74	Rupees Five Hundred Seventy Four And Paise Seventy Four Only
106	300 to 350 m (Code No-O010G)	M	200.00	638.60	Rupees Six Hundred Thirty Eight And Paise Sixty Only
107	Supply of ISI mark 175mm nominal bore,plain and steel casing pipe grade of steel Fe 410 of wall thickness conforming to IS 4270-2001 and latest ammendments, electrical resistance welded steel tubes, material and conforming to IS 1387-1993 and manufactured by basic open hearth electric or basic oxygen process in random length of 5-7m both ends.threaded conforming to IS 554-1985 one end fixed with socket conforming to IS 4270-2001 and the other end with screwed pipes all shall be responsibaly free from defects. The tubes shall be responsible straight end should be with ISI marking weighing 25.10kg/m.prices include Collar-Medium duty (P.154, I.No 32, O160A) BWSSB.SR 2021-22	Rmtr	240.00	1990.99	Rupees One Thousand Nine Hundred Ninety And Paise Ninety Nine Only
108	Supply and delivery of galvanized mild steel tubes of 6mtr standard length heavy duty (C Class) as per IS 1239 (Part-I) 1990 with latest amendments with ISI Mark (one end fitted with Heavy Duty collar and other end fitted with protective cover) 50 mm (P. No.162, I. No. 33.1 BWSSB SR 2021-22)	Each	100.00	3141.50	Rupees Three Thousand One Hundred Forty One And Paise Fifty Only
109	PVC pipe - OD 250mm and 6 Kg/sqcm P.No-34, Sl.No.1175,BWSSB.SR 2021-22	Rmtr	24.00	1133.00	Rupees One Thousand One Hundred Thirty Three Only
110	Supplying and drawing 3 core flat PVC sheathed submersible pump cable manufactured with electrolytic grade copper withflexible copper with low resistance conductor confirming to13:8130-1984 and virgin grade PVC insulation and powdercoating extruded PVC sheathed suitable for working voltageupto 1100 V as per IS-694:2010. 3C x 6 mm2 P. No. 4/ I No. 2.6.4 KPWD Electrical SR 2021-22	Rmtr	2480.00	242.00	Rupees Two Hundred Forty Two Only

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Sl No	Description of Item	Unit	Quantity	Rate, Rs	
				In Figures	
111	Providing,supplying to work site, Submersible Pump Set of 150mm dia suitable for bore well and confirming to IS 8034-2000;3Phase, SS Bowl & Impeller with Low volt Motor as per specifications,as per necessary ammendments and instructions of engineer incharge of work. 15.00 HP - 120 LPM @ 266 m = 23 STG Outlet Dia - 2.00"(P. No.161, I. No. 18.6, BWSSB SR 2021-22)	Nos	4.00	71335.74	Rupees Seventy One Thousand Three Hundred Thirty Five And Paise Seventy Four Only
112	Earthing: Supplying and fixing and wiring earth electrode for grounding circuits IC cutouts and other equipments on the meter board in the pit. The pits should be filled up with equal proportion of salt and charcoal 150mm around the pipe to complete depth. The connection from the pipe to the conduits etc. is to established through GI wire of sizes as per clause 7.3.3 of IS 732 using 12mm bolts, nuts, washers and check nuts, the pipe shall have 16 through holes of 12mm dia. (P. No.164, I. No. 45, BWSSB SR 2021-22)	job	4.00	3862.50	Rupees Three Thousand Eight Hundred Sixty Two And Paise Fifty Only
113	Supply and fixing polished wood board made of not lessthan 15mm thick plank on both sides of not more than 2pieces and fixing the same to the wall using tapered invertedwooden plugs screws. 20" x 20" x 2.5" (P No. 10 No.5.6.6,Part-I Electrical SR 2021-22)	Each	4.00	315.00	Rupees Three Hundred Fifteen Only
114	Supplying & fixing of Porcelain fuse channel with cut out onexisting wooden/panel using necessary nuts, bolts andwashers. 63 A (P No. 10 No.5.6.6,Part-I Electrical SR 2021-22)	Each	4.00	372.00	Rupees Three Hundred Seventy Two Only
115	Supplying & fixing miniature circuit breakers on existing MCB distribution boards using necessary fixing materialsand 'C' Type curve, indicator ON/OFF, energy cross-3 withShort circuit breaking capacity of 10K and complete wiring asrequired confirming to IEC 60898. 50-63 A TPN (P No. 13 I.No.5.17.9,Part-I Electrical SR 2021-22)	Each	4.00	2399.00	Rupees Two Thousand Three Hundred Ninety Nine Only
116	Earth work excavation by manual means for drains,canals, waste weir, draft, approach channels, key trenches, foundation of bridges and such simillar works in all kinds of soils , as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, removal of stumps and other deleterious matter, excavated surface leveled and sides neatly dressed disposing off the excavated stuff or sorting & stacking the selected stuff for reuse in a radius of 50 m and lift upto 1.5 m including cost of labour, tools & other appurtenaces required to complete the work.Loading and Unloading of Stone Boulder/Stone aggregates/ Sand/Kankar/Moorum. (Tipper 14 m3) (V-I.No 1.4,Page No-5 PWD SR 2021-22)	Cum	360.00	191.58	Rupees One Hundred Ninety One And Paise Fifty Eight Only
117	Supplying and filling in plinth with sand under floors, foundation of Bridges including watering, ramming, consolidating and dressing complete. (P.No-7,I No-1.11,V-I of PWD SR 2021-22)	Cum	72.00	2242.31	Rupees Two Thousand Two Hundred Forty Two And Paise Thirty One Only
118	Supplying PVC ringtite pipes conforming to IS 4985:2000 with latest amendments and conveying to worksite, rolling and lowering into trenches, laying true to line and level and perfect linking at joints, testing and commissioning, including loading unloading at both destinations and cuts of pipes wherever necessary including jointing of PVC pipes and specials (excluding cost of specials) with jointing of approved type, with all labour with all lead & lift including encasing the pipe alround to a depth of not less than 15 cms. with soft gravel or selected earth available from the excavation etc. complete and giving necessary hydraulic test to the required pressure as per ISS (Contractor will make his own arrangements for procuring water for testing) etc.63mm outer dia, 6kg/sqcm & class 3 for:(P. No.134 I No 1.4 BWSSB SR 2021-22)	Mtr	800.00	157.59	Rupees One Hundred Fifty Seven And Paise Fifty Nine Only

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